

EXECUTIVE SUMMARY

DRAFT

ENVIRONMENTAL IMPACT REPORT (EIR)

STATE CLEARINGHOUSE NO 2011061085

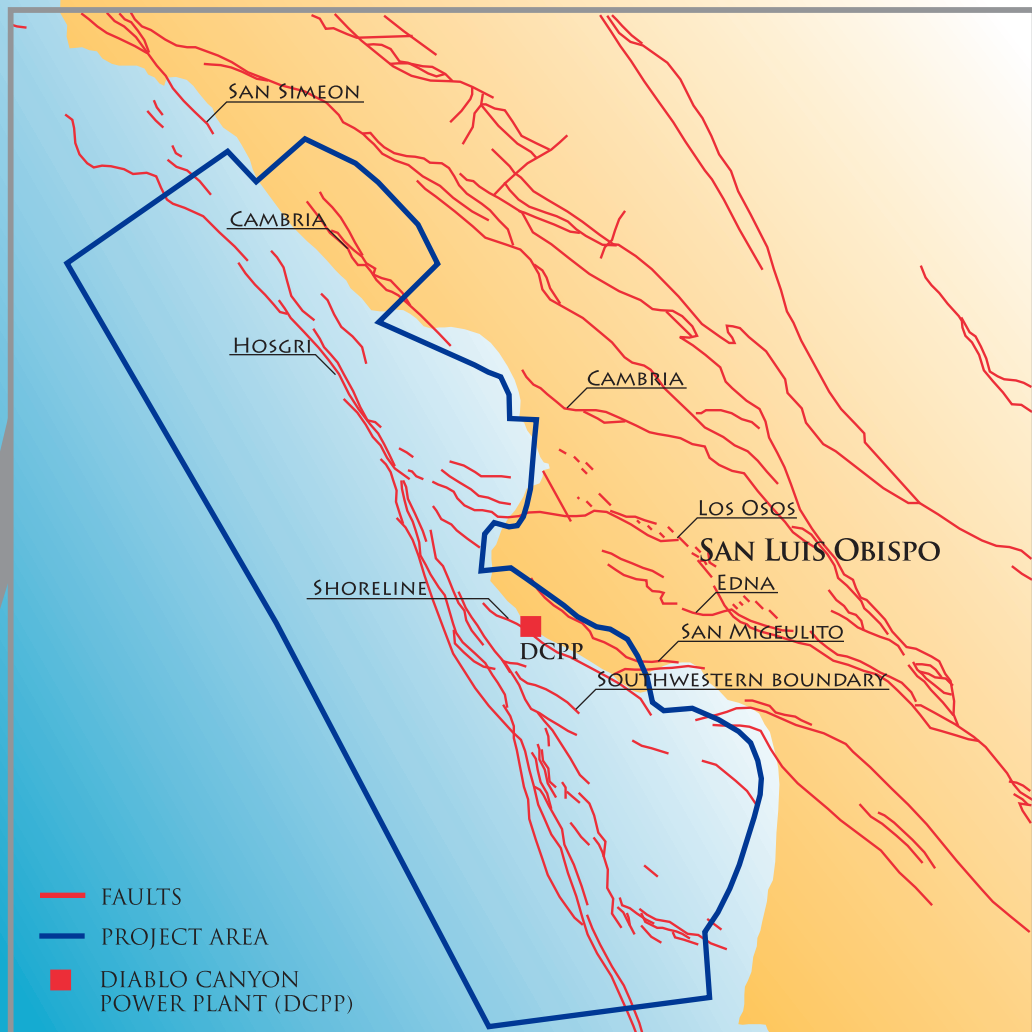
CSLC EIR NO. 758

FOR THE

CENTRAL COASTAL CALIFORNIA SEISMIC IMAGING PROJECT



PACIFIC
OCEAN



DETAIL



PREPARED FOR
CALIFORNIA STATE LANDS COMMISSION
MARCH 2012

NOT TO SCALE

EXECUTIVE SUMMARY

INTRODUCTION

The objective of this Executive Summary is to provide a brief description of Pacific Gas and Electric Company's (PG&E's) proposed Central Coastal California Seismic Imaging Project (Project). The Executive Summary introduces key components of the Project activities and the project timeline, identifies significant environmental effects that would result from implementation of the Project, lists feasible mitigation measures that would avoid or minimize those significant environmental effects, and summarizes Project alternatives. Please refer to the Environmental Impact Report (EIR) text for complete descriptions and discussions of the Project, alternatives, thresholds used to determine significance of impacts, potentially significant environmental effects, and mitigation measures.

The California State Lands Commission (CSLC) is the Lead Agency for preparation of the EIR pursuant to the California Environmental Quality Act (CEQA), because PG&E has submitted an application to the CSLC for a Geophysical Survey Permit to conduct the Project. Specifically, PG&E is seeking approval from the CSLC to conduct high-energy seismic surveys in the vicinity of the Diablo Canyon Power Plant (DCPP). As Lead Agency, the CSLC has prepared the EIR to fulfill its obligations under CEQA prior to making a decision on whether or how to approve the proposed Project and issue the Geophysical Survey Permit.

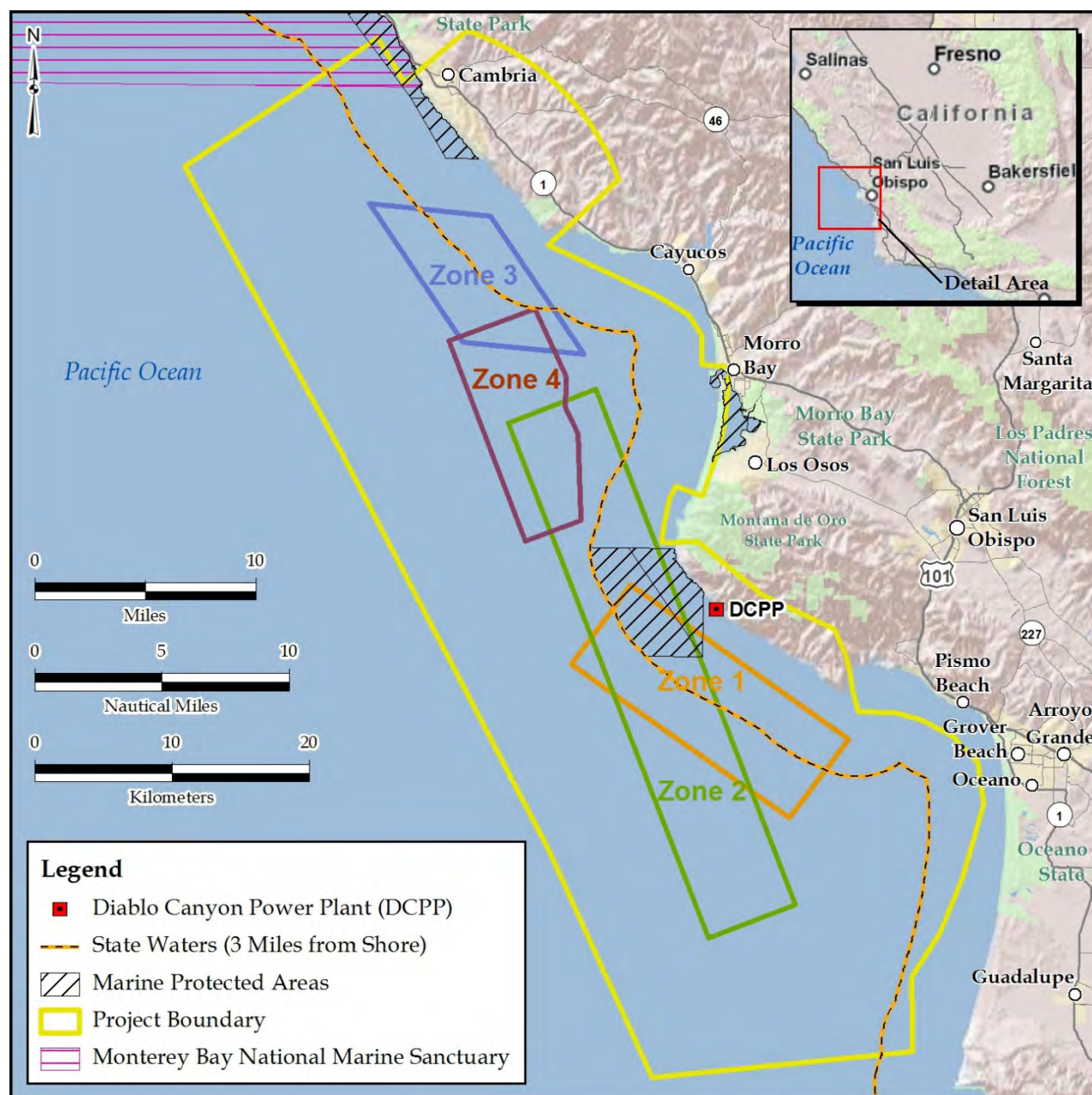
PROJECT LOCATION

The Project, as proposed by PG&E, would be conducted along the central coast of California, between Cambria and Guadalupe, in San Luis Obispo County within the area outlined on Figure ES-1. The Project would encompass an offshore area of approximately 530 square nautical miles (nm²) (1,820 square kilometers [km²]), and would also involve onshore and nearshore activities.

SUMMARY OF PROJECT PURPOSE AND NEED/PROJECT OBJECTIVES

The DCPP, which has been in commercial operation since 1985, is an electricity-generating nuclear power plant located on the central California coast in Avila Beach, San Luis Obispo County. Based on geological studies conducted prior to and since construction of the DCPP, several fault zones including the Hosgri, Los Osos, San Luis Bay, and the recently (2008) discovered Shoreline fault zones are known to be in the DCPP vicinity; however, their geometries and interconnections are not fully understood.

Figure ES-1 Project Location Map



Source: Adapted from PG&E 2011b.

PG&E's Geosciences staff believes that data gathered from the additional studies that comprise the Project would improve characterizations of these fault zones and allow PG&E to refine estimates of the frequency and intensity of ground motion that is likely to occur in the area surrounding and including the DCP. This information may also improve assessments of the potential seismic hazard at the DCP. The specific objectives of the Project are to:

- Record high-resolution, wide two-dimensional (2D) and three-dimensional (3D) seismic reflection profiles of major geologic structures and fault zones in the vicinity of the DCP;
- Obtain improved deep (>0.6 mile [>1 kilometer (km)]) imaging of the Hosgri and Shoreline fault zones in the vicinity of the DCP to constrain fault geometry;
- Obtain improved (>0.6 mile [>1 km]) depth imaging of the intersection of the Hosgri and Shoreline fault zones near Point Buchon;
- Obtain improved (>0.6 mile [>1 km]) depth imaging of the intersection of the San Simeon and Hosgri fault zones near Point Estero;
- Determine the southern extent of the Shoreline fault zone and its relation to the other mapped faults in San Luis Bay; and
- Augment current regional seismic database for subsequent use and analysis.

Figure ES-1 above shows the four areas targeted for data acquisition in the offshore portion of the Project area, labeled Zones 1 through 4.

ORGANIZATION OF EIR

The EIR contains the following information:

- Section 1.0 – Introduction provides an introduction to the EIR.
- Section 2.0 – Project Description describes the proposed Project, its location, and schedule.
- Section 3.0 – Cumulative Setting and Methodology identifies the cumulative projects that contribute to the cumulative environment.
- Section 4.0 – Existing Environment and Environmental Impact Analysis describes existing environmental conditions, proposed Project-specific impacts, and mitigation measures. This section also evaluates the proposed Project's cumulative impacts.
- Section 5.0 – Alternatives to the Proposed Project describes the alternatives to the proposed Project carried forward for analysis, and the alternatives that were considered for, but eliminated from, detailed evaluation. The environmental impacts of the alternatives are also evaluated in this section.

- Section 6.0 – Other Required CEQA Sections addresses other required CEQA elements, including evaluation of growth-inducing impacts.
- Section 7.0 – Environmental Justice describes existing conditions and Project-specific effects. It also analyzes the alternatives regarding environmental justice.
- Section 8.0 – Mitigation Monitoring Program provides a tabular summary of all mitigation measures identified to avoid or reduce significant impacts, the party(ies) responsible for tracking each mitigation measure, and how compliance with the mitigation measure will be reported.
- Section 9.0 – Report Preparation Sources lists the individuals and their roles in the preparation of this EIR.
- Section 10.0 – References lists reference materials used to prepare the report.

Ten Appendices follow the main text: (A) Project Mailing List; (B) Public Scoping Documentation (which includes the NOP, the public meeting transcripts, copies of comments received on the NOP, and an index specifying the location in the Draft EIR where the comments are addressed); (C) Technical Specifications of Seismic Survey Equipment; (D) PG&E Draft Marine Wildlife Contingency Plan; (E) Terrestrial Biology Survey Report; (F) Avian Protection Plan; (G) Emissions Estimate Calculations; (H) Marine Mammal Technical Report; (I) Underwater Noise Assessment Technical Report; and (J) Shoreline Fault Zone Report, Appendix B Geology.

PROJECT DESCRIPTION SUMMARY

The proposed surveys involve (1) introduction of seismic sources or sounds on- and offshore and (2) recording of the energy responses (reflections from various features in the subsurface). This is a technique commonly used by geophysicists to map fault locations and angles.

The offshore component of the Project would consist of operating a geophysical survey vessel, its associated survey equipment, and support/monitoring vessels within the Project area, out as far as approximately 15 nm (30 km) offshore. The survey would be conducted along the central coast from approximately Cambria to Guadalupe. Portions of the Point Buchon, Cambria, and White Rock Marine Protected Areas (MPAs) lie within the Project area. In addition, the Monterey Bay National Marine Sanctuary (MBNMS), a Federal-protected marine sanctuary that extends northward from Cambria to Marin county, is located within the northern portion of the Project area; survey track lines would not extend into the MBNMS. The support vessels would transit between the Project area and either Port San Luis or Morro Bay.

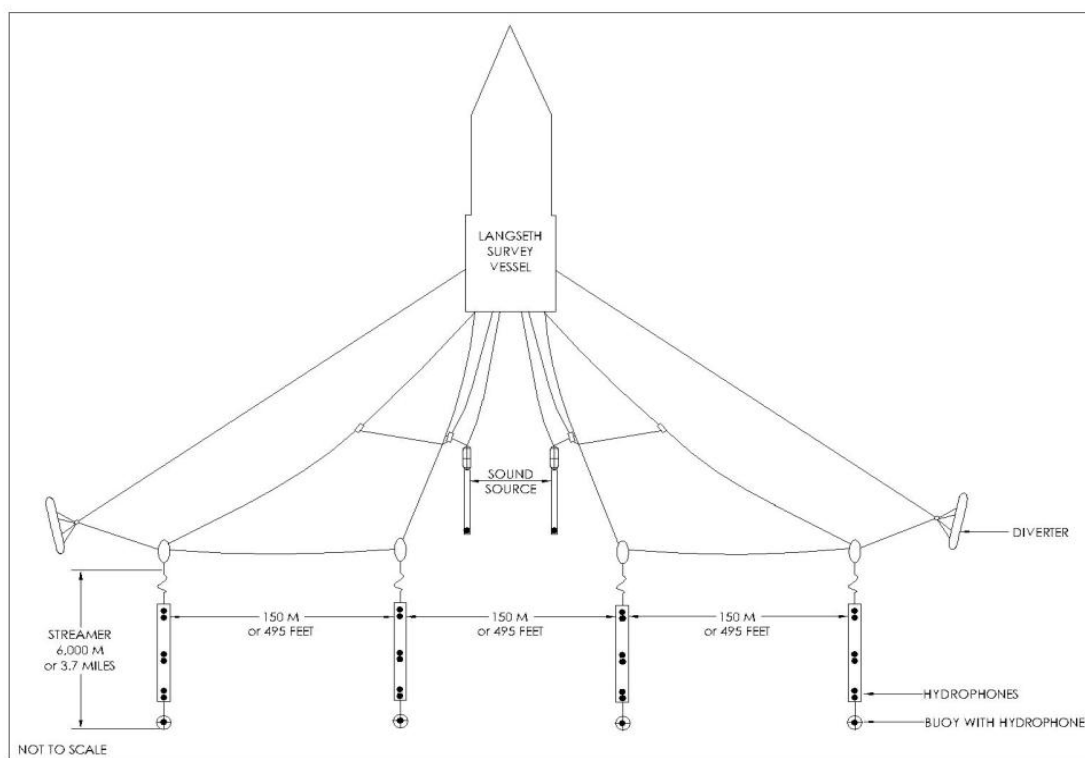
The geophysical survey vessel would tow a series of sound-generating air guns and sound-recording hydrophones along pre-determined shore-parallel and shore-perpendicular transects. The *R/V Marcus G. Langseth* (*Langseth*),¹ shown in Figure ES-2, has been selected by PG&E for use as the survey vessel. The *Langseth* was designed as a seismic research vessel, with a propulsion system designed to be as quiet as possible to avoid interference with the seismic signals. The towing configuration would be generally as depicted in Figure ES-3. Three support vessels would be used to support the offshore survey.

Figure ES-2 R/V *Marcus G. Langseth*



Source: PG&E 2011b.

Figure ES-3 *Langseth* Hydrophone Towing Configuration



Source: PG&E 2011b.

¹ PG&E is currently in negotiation to secure the services of the *Langseth* to perform the proposed offshore survey activities. The *Langseth* (and her associated characteristics, such as size and speed) is considered typical of vessels appropriate for use in seismic surveys. For the purpose of this EIR, whenever the *Langseth* is specifically noted, the substitution of a different, comparable vessel would be consistent with the impact evaluation in this document. Similarly, the substitution of different, comparable vessels to the support vessels identified in this section (*Sea Trek* and *Dolphin II*) would be consistent with the impact evaluation in this document.

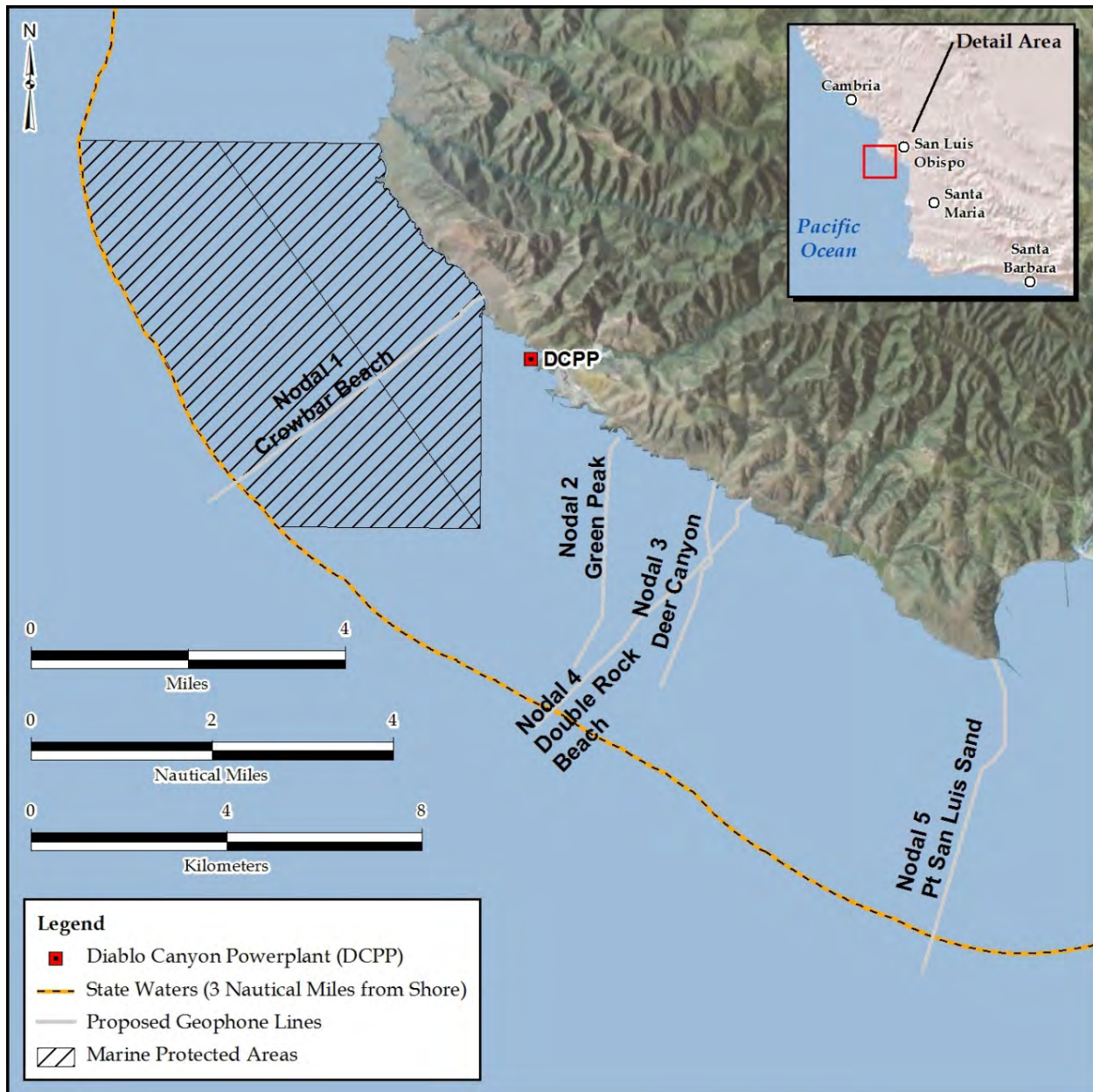
1 During the survey, an array consisting of 18 active air guns, divided into two subarrays,
2 would likely be used. The subarrays would be configured as two identical linear arrays
3 or "strings." Each string would have 10 air guns; nine air guns in each string would be
4 fired simultaneously (for a total volume of approximately 3,300 cubic inches), whereas
5 the tenth would be kept in reserve as a spare, to be turned on in case of failure of
6 another air gun. The subarrays would be fired alternately during the survey. During air
7 gun shots, a brief (approximately 0.1 second) pulse of sound would be emitted. The
8 timing of the shots would depend on the ship speed and recording interval. Assuming a
9 4.5-knot (nm/hour) ship speed and 16-second recording interval, air guns would
10 discharge once every 15 to 20 seconds; the shot interval would, therefore, be
11 approximately every 123 feet (37.5 meters). The air guns would be silent between
12 shots. Along with the air gun operations, two additional acoustical data acquisition
13 systems would be operated continuously from the survey vessel: a multibeam
14 echosounder and a sub-bottom profiler.

15
16 Geophones would be placed in the nearshore area, in water depths of up to
17 approximately 66 feet (20 meters) using a vessel and, in some locations, divers. For
18 the nearshore survey area, where it is too shallow for towed arrays, geophones
19 would be placed on the seafloor by hand to record seismic responses from on- and
20 offshore seismic sources. Lines of disc-shaped geophones strung together on cables
21 would be placed on the seafloor along the approximate routes depicted in
22 Figure ES-4. PG&E estimates that it will deploy approximately 600 geophones for
23 the Project.

24
25 Onshore activities would occur between Cambria and Guadalupe in the three areas
26 depicted in Figure ES-5: the Northern Area, Central Area, and Southern Area.

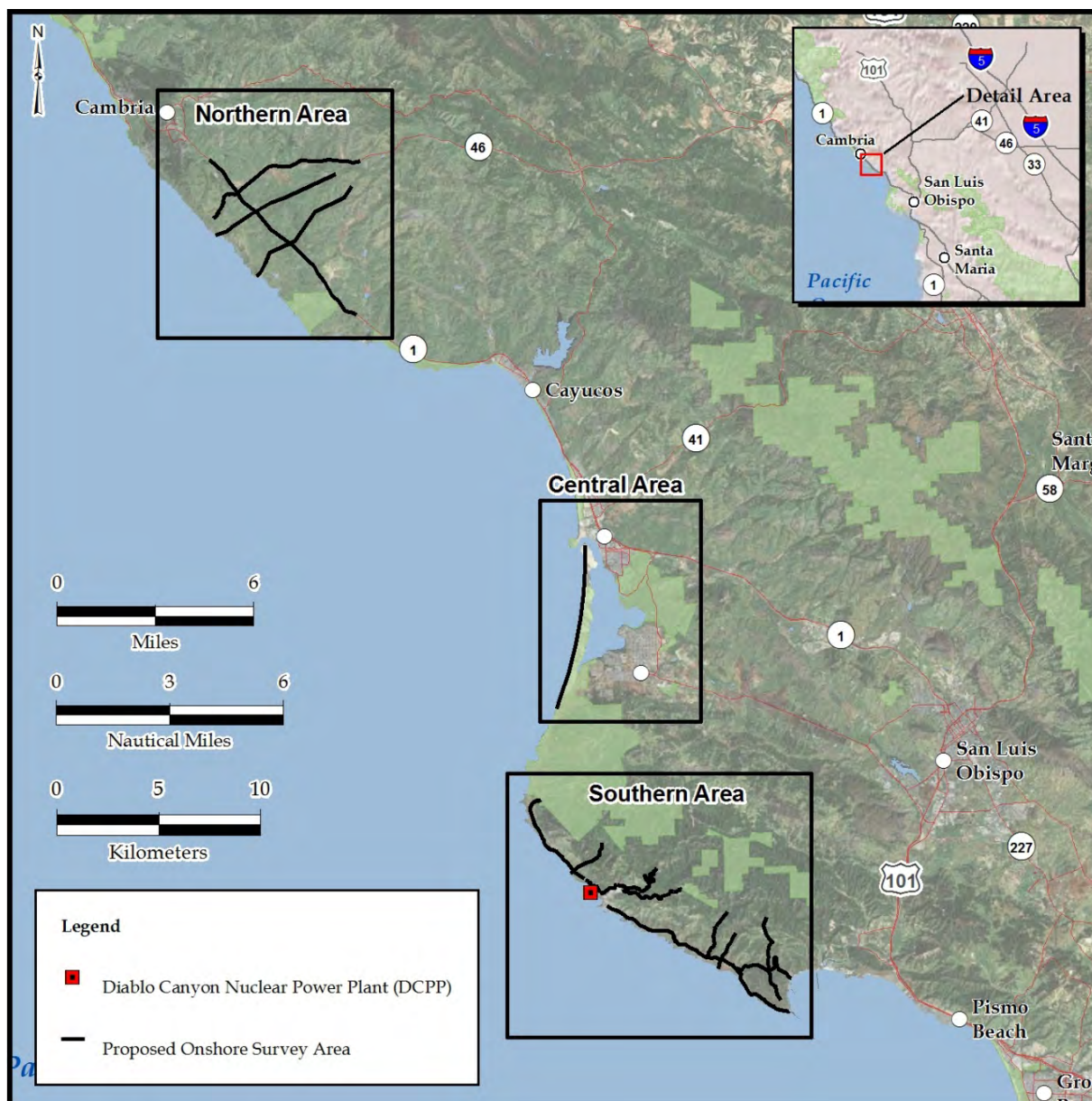
27
28 In the Northern Area, activities would include the temporary placement of 6-inch-high
29 and 5-inch-wide, nodal (uncabled) receivers in agricultural areas and alongside roads,
30 including Route 1. In the Central Area, 6-inch-high and 5-inch-wide nodal (uncabled)
31 receivers would be manually placed along the Morro Bay sandspit. In the Southern
32 Area, nodal (both cabled and uncabled) receivers would be manually placed, and
33 Vibroseis and Accelerated Weight Drop (AWD) seismic surveys would occur along
34 roads and trails that are predominantly on PG&E property. The surveys would require
35 up to four Vibroseis trucks or one AWD vehicle, depending on specific route and
36 accessibility.

Figure ES-4 Proposed Nearshore Geophone Line Routes



Source: PG&E 2011b.

Figure ES-5 Proposed Onshore Survey Areas



Source: PG&E 2011b.

1 The key components of the Project activities are summarized below in Table ES-1.
2

Table ES-1 Summary of Key Project Activities by Location

Area		Key Project Activities
Offshore Areas	Zones 1 to 4 (including associated turning areas and run-ins/run-outs)	<ul style="list-style-type: none"> • Transfer crew and equipment to the geophysical survey vessel while it is moored in Port San Luis • Using primary geophysical survey vessel, tow strings of seismic sources (air guns) and sound recording devices (hydrophones) along pre-determined routes • Throughout surveys, transfer crew, supplies, equipment and provisions from Port San Luis to survey vessel (using secondary vessel) • After completion of surveys, transfer crew, supplies, and equipment from survey vessel to Port San Luis (using secondary vessel)
	DCCP Vicinity	<ul style="list-style-type: none"> • Transport large equipment (geophones and cables) from local vessel in Morro Bay Harbor to geophysical survey vessel • Place geophone lines on seafloor along five routes roughly perpendicular to shoreline • Remove geophone devices at survey conclusion
Onshore Areas	Northern Area (Cambria Vicinity)	<ul style="list-style-type: none"> • Place nodal (uncabled) geophones along four onshore routes • Leave geophones in place for duration of offshore seismic surveys • Conduct routine status checks and perform needed maintenance on geophones • Remove geophones at survey conclusion
	Central Area (Morro Strand)	<ul style="list-style-type: none"> • Place nodal (uncabled) geophones along one onshore route • Leave geophones in place for duration of offshore seismic surveys • Conduct routine status checks and perform needed maintenance on geophones • Remove geophones at survey conclusion
	Southern Area (DCCP Vicinity)	<ul style="list-style-type: none"> • Place nodal (uncabled) geophones along eight onshore routes • Leave geophones in place for duration of offshore seismic surveys • Conduct routine status checks and perform needed maintenance on geophones • Temporarily place cabled geophones along a given survey route during deployment of the seismic source on that route, to confirm proper deployment • Deploy vehicle-mounted equipment (vibrators or accelerated weight drop equipment, depending on route accessibility) along eight onshore survey routes • Remove nodal geophones at survey conclusion

No construction, excavation or grading would occur as part of the Project, and very limited ground penetration would be required as part of the onshore seismic surveys. The only ground-penetrating equipment related to the Project would be the 5-pound nodal receivers, with 5-inch spikes that would be pressed into the ground. These nodal receivers would be deployed by foot crews. Most of the nodal receivers would be placed along established roadways; however, some receivers would also be placed in agricultural fields in the Northern Area. During the onshore seismic surveys, Project-related vehicle traffic would be restricted to roads and trails, and (Northern Area only) to agricultural fields.

As proposed, PG&E would conduct the offshore high energy seismic survey, including mobilization and demobilization, within an 82-day period from September to December 2012. Surveys would be conducted 24 hours per day, 7 days per week. The proposed schedule is summarized in Table ES-2.

Table ES-2 Anticipated Project Timeline

Task	Duration	
Mobilization from San Diego to Project Site	6 days	
Equipment Deployment Offshore Geophone Deployment Pre-Activity Marine Mammal Surveys	5 days (tasks occur concurrently)	
Onshore Geophone Deployment	7 days (concurrent with offshore deployment)	
Sound Check/Verification	5 days	65 days
Seismic Survey	41 days (operations assumed as 24 hours a day, 7 days a week)	
Streamer and Air Gun Preventative Maintenance	4 days	
Additional shutdowns (marine mammal presence, crew changes, unanticipated weather delays)	8 days	
Marine Vessel Refueling	7 days	
Onshore Source Line Sound Generation	7 days (concurrent with offshore surveys)	
Demobilization	6 days	
Total	82 days	

Source: PG&E 2011b.

1 PG&E proposes the Applicant Proposed Measures (APMs) summarized in Table
 2 ES-3 to reduce potential impacts (PG&E 2011b). These measures are incorporated
 3 into the proposed Project.
 4

Table ES-3 Applicant Proposed Measures

Affected Resource	APM No.	APM
<i>Marine Biology</i>		
Impacts to migrating and summer season whales in the Project area	1	Survey Timing
Impacts to marine wildlife due to high sound levels of air gun array	2	Establishment of Safety Zone and Exclusion Zone
	3	Real-Time Sound Measurements/ Exclusion Zone Adjustments
	4	Use of Ramp-Up Process
	5	Air Gun Operation During Turns and Transects
General impacts to marine mammals (sound impacts, harassment, collision)	6	Aerial Surveys to Identify Presence of Marine Mammals
	7	Use of Marine Mammal Monitors During Surveys
	8	Use of Passive Acoustic Monitoring
Impacts to black abalone due to nearshore geophone deployment	9	Deployment of Nearshore Geophone Lines by Diver-Biologists
<i>Fishing</i>		
Impacts to commercial and recreational fishing operations	10	Survey Timing to Reduce Impacts to Fishing and Recreational Uses
<i>Terrestrial Biology</i>		
General terrestrial biology impacts	11	Worker Environmental Awareness Training Program (WEAP)
	12	Pre-Activity Biological Survey
	13	Biological Monitoring During Survey Activities
Impacts to nesting birds	14	Establishment of Buffer Zones Around Active Nests
Impacts to burrowing owls	15	Establishment of Exclusion Zones Around Active Owl Burrows
Impacts to kangaroo rats	16	Establishment of Exclusion Zones Around Active Kangaroo Rat Burrows
Impacts to Morro shoulderband snails	17	Establishment of Exclusion Zones Around Morro Shoulderband Snails
Impacts to streams and wetlands	18	Avoidance of Streams and Wetlands
Impacts to snowy plover, California least terns, California clapper rails, and California black rails	19	Avoidance of Snowy Plover, California Least Tern, California Clapper Rail, and California Black Rail Nesting Habitats
Lighting impacts on migrating birds	20	Lighting Use During Nighttime Survey Activities

Table ES-3 Applicant Proposed Measures

Affected Resource	APM No.	APM
Onshore Project Area		
Impacts due to trash from field crews	21	Ongoing Trash Removal
Impacts from passage of vehicles off road	22	Limited Off-Road Vehicle Travel
Impacts to onshore cultural resources	23	Cultural Resource Monitoring During Survey Activities
Impacts from brush fires in the Project area	24	Brush Fire Prevention Procedures
Impacts to emergency response (Public Safety and Traffic and Transportation)	25	Emergency Response Procedures
Nearshore and Offshore Project Area		
Impacts to navigational safety and use of offshore Project area by recreational and commercial boaters and fishermen	26	Issuance of Notices
Impacts from oil spills	27	Oil Spill Contingency Plan
Impacts to habitat from geophone relocation, as needed	28	Relocation of Geophones by Divers

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The Project would generate potentially significant environmental impacts on air quality, terrestrial and marine biological resources, greenhouse gases (GHGs), land use and recreation, and noise. With the implementation of mitigation measures specified in this report, many of these impacts would be reduced to *Less than Significant*, but several impacts to air quality, marine biological resources, GHGs, and land use and recreation would remain *Significant and Unavoidable* even after all appropriate and feasible mitigation measures are applied.

This EIR employed a number of techniques to analyze the expected noise levels and exposure resulting from the Project, and the effects those conditions may have on marine mammals. The EIR provides estimates of the numbers of individuals, by species that would be affected. The analysis also used factors such as population size, density expected during the survey and sensitivity to the frequency that would be generated by the air guns and other noise sources to put those estimates into the context of the vulnerability of each species.

For special status species, a single “take” – from either physical injury or disturbance -- is considered to be significant in this analysis. The EIR found *Significant and Unavoidable* impacts to fin, humpback and blue whales resulting from noise. Substantial

1 interference in the movement of any native resident, such as the Morro Bay stock of the
2 harbor porpoise, is also considered to be significant; based on this threshold, the
3 Project's impacts on the Morro Bay stock of the harbor porpoise are expected to be
4 *Significant and Unavoidable*. Project impacts on sea otters are also considered to be
5 *Significant and Unavoidable* because of the proximity of the survey to sea otter habitat
6 and the species' special status under State and federal laws, although the survey is
7 unlikely to affect pup areas. See Section 4.4 –Biological Resources - Marine for the
8 discussion of impacts on marine mammals and sea otters.

9
10 The Project is also expected to have *Significant and Unavoidable* impacts on air quality
11 and greenhouse gases (see Sections 4.2 – Air Quality and 4.7 – Greenhouse Gases,
12 respectively), commercial fishing (see Section 4.13 – Commercial Fishing), and Marine
13 Protected Areas (see Section 4.10 – Land Use and Recreation).

14
15 Table ES-4 presents a summary of impacts and mitigation measures for the Project,
16 organized by resource area. Within each resource area, the table describes and
17 classifies each impact, lists recommended mitigation, and notes the level of impact after
18 mitigation. Within each resource area, all impacts that remain significant after mitigation
19 (*Significant and Unavoidable*) are presented first, followed by significant impacts that
20 can be eliminated or reduced below the applicable significance threshold (*Less than*
21 *Significant with Mitigation*). Impacts that are *Less than Significant* and do not require
22 mitigation, or that have beneficial impacts, are discussed in Section 4 – Existing
23 Environment and Environmental Impact Analysis in their respective sections.

Table ES-4 Summary of Environmental Impacts for the Project

Impact No.	Impact	Impact Class	Recommended Mitigation Measures
Section 4.2 Air Quality			
AQ-1	Mobilization and demobilization activities (including equipment deployment and retrieval) would result in daily emissions of criteria pollutant that would exceed air quality significance thresholds	SU	MM AQ-1a. Application of the “Standard Mitigation Measures for Construction” (San Luis Obispo County Air Pollution Control District (APCD) CEQA Handbook) MM AQ-1b. Implementation of Best Available Control Technology (BACT) Measures (San Luis Obispo County CEQA Handbook)
AQ-2	Survey activities would result in daily emissions of criteria pollutants that would exceed air quality significance thresholds	SU	MM AQ-1a and MM AQ-1b , above
AQ-3	Total Project activities would result in quarterly emissions of criteria pollutants that would exceed air quality significance thresholds	SU	MM AQ-1a and MM AQ-1b , above MM AQ-3a. Implementation of Fugitive Dust Controls MM AQ-3b. Prepare a Project-Specific Emission Reduction Program
Section 4.3 Terrestrial Biological Resources			
TERBIO-2	Lighting from offshore survey activities would adversely affect migrating birds	LTSM	MM TERBIO-2. Reduce Light Radiating from Survey Vessels
TERBIO-7	Onshore seismic survey activities may require some limited tree trimming, which would adversely affect native oak trees by improper thinning, or disease transmittance	LTSM	MM TERBIO-7. Retain Certified Arborist for Assessment and Trimming of Native Trees
TERBIO-8	Onshore trucks and equipment required for the Project would result in the spread of invasive species and the pathogen responsible for Sudden Oak Death	LTSM	MM TERBIO-8. Sanitize Vehicles to avoid Spread of Sudden Oak Death and Invasive Weeds
Section 4.4 Marine Biological Resources			
MARINEBIO-1	Vessel transit during mobilization and demobilization activities would potentially disturb or kill (due to collision) sea turtles, fish, or marine mammals	LTSM	MM MARINEBIO-1. Marine Species Protocols
MARINEBIO-12:	Injury or mortality to marine mammals would occur due to noise during seismic survey acquisition	SU	MM MARINEBIO-12a. Expand Pre-Survey to 8.6 Miles (14 Kilometers) and Perform 10 Days in Advance of Survey MM MARINEBIO-12b. Extend Aerial Surveys Throughout Survey

Table ES-4 Summary of Environmental Impacts for the Project

Impact No.	Impact	Impact Class	Recommended Mitigation Measures
			Period MM MARINEBIO-12c. Avoidance of Pinniped Haul-Outs MM MARINEBIO-12d. Required Marine Mammal Observer Qualifications, Use of Equipment and Procedures to Enhance Detection Rates, and Performance of Nighttime Monitoring MM MARINEBIO-12e. Increase Size of Exclusion Zone During Surveys MM MARINEBIO-12f. Monitoring Using Two Scout Boats with Marine Mammal Observers During Surveys MM MARINEBIO-12g. Perform Track Lines with Highest Mammal Densities During Daylight Hours MM MARINEBIO-12h. Increase Pre-Ramp-Up Scan Period MM MARINEBIO-12i. Adaptive Management in Case of Multiple Shutdowns MM MARINEBIO-12j. Contingency for Sighting of North Pacific Right Whale
MARINEBIO-13	Injury or mortality to Southern Sea Otters would occur due to noise during seismic survey acquisition	SU	MM MARINEBIO-12a through MM MARINEBIO--12i , above
Section 4.7 Greenhouse Gases			
GHG-1	The Project would result in emissions of GHGs that would exceed significance thresholds	SU	MM AQ-1a and MM AQ-1b , above
Section 4.10 Land Use and Recreation			
LU-1	Offshore Project activities would adversely impact offshore recreational activities during a peak season	SU	MM LU-1. Develop and Implement Communication Plan with Local Fishing and Boating Interests.
LU-2	Offshore project activities would conflict with some applicable land use plans	SU	MM LU-2. No Aircraft Less than 1,000 Feet Above Monterey Bay National Marine Sanctuary (MBNMS) Exclusion Zones

Table ES-4 Summary of Environmental Impacts for the Project

Impact No.	Impact	Impact Class	Recommended Mitigation Measures
Section 4.11 Noise			
NO-1	The proposed offshore activities would expose persons present in the waters to harmful noise levels	LTSM	MM NO-1. Observation and Removal of Divers from Survey Area
NO-2	The proposed onshore activities would result in a temporarily increase in ambient noise levels in the Project vicinity	LTSM	MM NO-2. Limit Weekend Hours of Operation
NO-4	The proposed onshore activities would expose persons to increased groundborne vibration or groundborne noise levels	LTSM	MM NO-2, above
Commercial Fishing (Section 4.13)			
FISH-1	Offshore Project activities would adversely impact commercial fishing by precluding fishing for all or most of a season	SU	MM LU-1, above
FISH-2	Project activities would have short-term adverse effects on catch resulting from survey-related noise	SU	MM LU-1, above

SU = Any impact that could be significant and for which no feasible mitigation has been identified, to reduce the impact to a Less than Significant level.

LTSM = Any impact that could be significant, but that can be reduced to a Less than Significant level with application of identified mitigation. Impacts in this category are otherwise considered potentially significant impacts, but for which Mitigation Measures (MMs) have been designed and would be enforced in order to reduce said impacts to below applicable significance thresholds.

SUMMARY OF ALTERNATIVES TO PROPOSED PROJECT

CEQA requires identification and evaluation in an EIR of a reasonable range of alternatives to a proposed project, including, if feasible, alternative locations. Pursuant to the State CEQA Guidelines² (§ 15126.6, subd. (a)), the EIR need only consider a range of feasible alternatives that will foster informed decision-making and public participation; therefore, while an EIR need not consider every conceivable alternative, an EIR must include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. The range of potential alternatives that must be considered, and thus the range presented in this EIR, is limited to those that would feasibly attain most of the Project objectives while avoiding or substantially reducing any of the significant effects of the proposed Project. Alternatives that were considered but rejected are identified and accompanied by brief, fact-based explanations of the reasons for rejection (see Section 5 -- Alternatives). Among the factors that may have been used to eliminate alternatives from detailed consideration, as permitted by CEQA, are (1) a failure to meet most of the project objectives, (2) infeasibility, or (3) inability to avoid significant impacts (State CEQA Guidelines, § 15126.6, subd. (c)). A wide range of alternatives was considered for evaluation in this EIR, and is summarized in Table ES-5.

Table ES-5 Summary of Alternatives Considered in EIR

	Alternative Concept	Description/Rationale	Eliminated from Further Consideration	Retained for Full Evaluation
I	No Project	No 3D survey; use existing information and desktop analyses to assess faults and seismic hazards.		X
II	Survey Timing	a. Daylight Survey Only	X	
		b. Phased Survey		X
III	Survey Footprint	a. Single Racetrack Configuration	X	
		b. Three-Loop Configuration (exclude MPAs to north)		X
		c. Two-Loop Configuration		X
		d. Southern Loop only	X	
IV	Survey Techniques	a. Desktop analyses	X	
		b. No noise source – Microseismic, Passive Monitoring, Electromagnetic	X	
		c. Controlled-Source Methods, including Marine Vibroseis	X	
		d. Deep-towed Acoustics/Geophysical System	X	

The alternatives retained for further consideration are discussed briefly in the following paragraphs.

² The State CEQA Guidelines are found in California Code of Regulations, Title 14, section 15000 et seq.

No Project Alternative (Alternative I)

The CEQA requires the No Project Alternative and its impact to be evaluated so that decision-makers, reviewing agencies, and the public can compare the impacts of approving the proposed Project with the impacts of not approving the proposed Project. In this case, the No Project Alternative (Alternative I) means CSLC would not grant PG&E a Geophysical Survey Permit to conduct the high-energy seismic surveys, and PG&E would rely on existing information and desktop analyses to assess seismic features, movement, and hazards. Information available for use would include, but not be limited to:

- Data collected to date and incorporated into existing reports, such as PG&E's Shoreline Fault Zone Report (PG&E 2011a);
- Data that are currently being collected as part of PG&E's Long Term Seismic Program, including results of the low-energy surveys conducted in 2011 and 2012; and
- Data and reports prepared by other parties, such as the United States Geological Survey.

Phased Survey (Alternative IIb)

This alternative would phase the survey over two separate time periods to reduce the survey time and impact within a single season. For the purpose of the evaluation, it was assumed that the two phases would be performed within the proposed period of September through December over 2 consecutive years. This period was proposed by PG&E as being less disruptive to marine mammal migrations.

Under this alternative, PG&E would review the initial phase of survey data to determine if the survey was producing useful data and if additional survey activity would be constructive. Therefore, this approach would require a minimum hiatus of several months between the two phases to allow processing of the initial data. If data acquisition proved to be sufficient, or the data collected were inconclusive, PG&E could elect to abandon the second phase of the survey. This alternative would therefore reduce the survey time within the first phase, and potentially eliminate the need for a second phase of surveys.

If the second phase of the survey were to be completed, mobilization/demobilization, equipment deployment, and aerial surveys would be repeated. It is not anticipated that a sound check/verification would be needed for the second phase of work. However, if a second sound check/verification were required, the cumulative durations of the initial and second phases would be longer than the duration of the single phase approach proposed by PG&E by at least 2 weeks.

Three Loop Configuration (Alternative IIIb)

This alternative would reduce the area of the survey to exclude Zone 3, in the northernmost part of the Project area. For this alternative, Zone 3 was omitted based on an assumption that information regarding geologic features in this zone could be acquired using existing information, or obtained with techniques other than 3D high-energy seismic surveys, and would be less critical to refining the DCP's seismic hazard analysis.

Other aspects of the Project would not change, including the proposed shore-based activity. Under this alternative, the mobilization, demobilization, and transit of the survey vessel would remain the same as that of the proposed Project. However, the total offshore time to conduct the survey would be reduced by approximately 7 days. In addition, it is likely that the survey vessel would not need to refuel. Therefore, the total project time (including mobilization and equipment set-up) would be 68 days instead of the 82 days estimated for the Project.

Double Loop Configuration (Alternative IIIc)

This alternative reflects the original two-loop racetrack configuration that was proposed by PG&E in April 2011. The survey track footprint is wider, extending further northward and seaward than the Project, but the track lines are not as close to the shore and traverse smaller portions of the MPAs than those proposed for the Project. The survey lines under this alternative do not traverse the White Rock-Cambria MPAs in the northern portion of the Project area, but survey vessel turn lines associated with this alternative extend into the MBNMS. Other aspects of the Project would remain the same, including the proposed shore-based activity.

Under this alternative, the mobilization, demobilization, and transit of the survey vessel would remain the same as that of the Project. Using vendor-supplied information provided at the time of the Application submittal, PG&E estimated that the survey time for this two-loop configuration would be approximately 52 days, and that the total Project time (including mobilization and equipment setup) would be 93 days. This estimated duration is approximately 11 days longer than that of the Project.

COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

The State CEQA Guidelines (§ 15126.6, subd. (d)) require that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. The relative impacts associated with each alternative are summarized in Table ES-6 for those resource areas for which *Significant and Unavoidable* impacts were identified. Although none of the alternatives identified (excluding the No Project

Alternative) would reduce the Project's *Significant and Unavoidable* impacts to *Less than Significant*, the alternatives, in some cases, would result in "less severe" *Significant and Unavoidable* impacts. Further information on impacts that could result from the alternatives can be found in Section 5.0 – Alternatives, in the EIR.

Table ES-6 Summary of Impacts Associated with the Project and Alternatives

Impact	Proposed Project	Alternative IIb	Alternative IIIb	Alternative IIIc	No Project
Noise Effects on Resident Species	SU	SU	SU	SU	NI
Noise Effects on Migratory Mammals	SU	SU	SU	SU	NI
Conflicts with MPAs and MBNMS	SU	SU	SU	SU	NI
Air and GHG Emissions	SU	SU	SU	SU	NI
Conflicts with Commercial Fishing	SU	SU	SU	SU	NI

LTS = Less than significant

NS = Not significant or adverse

NI = No impact

SU = Significant and unavoidable

CUMULATIVE IMPACTS SUMMARY

Cumulative effects refer to the impacts on the environment that result from a combination of past, present, and reasonably foreseeable projects and human activities. No reasonably foreseeable future projects are located within the boundaries of the onshore Project area; however, other, low-energy PG&E offshore surveys would occur within the offshore Project area, and several other projects may fall within this same area. The combination of the Project with these past, present, and reasonably foreseeable future projects was evaluated to determine whether it would result in significant cumulative impacts to environmental resources.

For most of the resource areas, the analysis identified no significant cumulative impacts given (1) the temporary nature of the Project activities and (2) the expectation that those projects would occur at different times and locations than the Project activities. Exceptions are as follows:

- Air Quality. Significance thresholds for air pollutants are developed by taking into consideration the levels at which individual project emissions would result in cumulatively considerable impacts. Therefore, because the Project is predicted to result in an increase in reactive organic gases, nitrogen oxides (NO_x), or particulate matter (PM₁₀ or PM_{2.5}) of more than its respective average daily or quarterly mass significance thresholds, it would contribute considerably to a significant cumulative impact.

- 1 • Biological Resources – Marine. Other actions external to the Project but within
2 the area could cumulatively affect harbor porpoise and other marine species.
3 Such actions include the following:
 - 4 ○ Low Energy 3D Geophysical Surveys planned by PG&E;
 - 5 ○ Commercial and Recreational Marine Traffic;
 - 6 ○ Oil Spills and Oil Transport;
 - 7 ○ National Oceanic and Atmospheric Administration Permits 14534, 15271,
8 540-1811, and 781-1824 for Marine Mammal Take (permits issued to parties
9 conducting research to allow potential incidental harassment of marine
10 mammals);
 - 11 ○ Morro Bay Marina Renovation Project (expected to start May/June 2012); and
 - 12 ○ 2011 Morro Bay Dredging.

13 The cumulative effect on marine mammals, especially the harbor porpoise, is
14 expected to be significant, with most of the impact resulting from the Project.

- 15 • Greenhouse Gases. GHG emissions are inherently a cumulative concern, in that
16 the significance of GHG emissions is determined based on whether such
17 emissions would have a cumulatively considerable impact on global climate
18 change. As discussed above, the Project represents a relatively small
19 percentage of the state and local GHG emissions. However, the Project would
20 result in an increase of GHGs and would also exceed APCD-proposed
21 thresholds for projects of its type (non-stationary combustion source emissions).
22 Therefore, the cumulative impacts from the Project and other GHG emission
23 sources are potentially considerable and significant.
- 24 • Commercial Fishing. For Commercial Fishing, the Project impacts could be
25 cumulatively significant because the additional low-energy seismic surveys
26 planned by PG&E contribute to the significant disturbance in the Project area
27 caused by the Project itself. By adding to the seasonal disruption, more fishing
28 activity is likely to be impacted. The disruption would occur at a time that the local
29 commercial fishing industry is in transition towards establishing a sustainable
30 fishery. Cumulative effects are potentially significant because the local
31 commercial fishing industry has been weakened by other factors, and the
32 proposed seismic surveys may contribute to multiple disruptions over
33 consecutive seasons (2011 and 2012).

34 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

36 For this Project, the No Project Alternative is the Environmentally Superior Alternative
37 because it is the only alternative that reduces all impacts to *Less than Significant*.
38 However, section 15126.6, subdivision (e)(2) of the State CEQA Guidelines states, in

part, that “*If the environmentally superior alternative is the “no project” alternative*, the EIR shall also identify an environmentally superior alternative among the other alternatives” (emphasis added).

Each of the alternatives other than the No Project Alternative reduces one or more of the significant impacts, but does not eliminate them altogether. As discussed in Section 5.4.1, Alternative IIIb (Three-Loop Configuration) has lower overall impacts than the other two alternatives. As discussed in Section 5.3.3, Alternative IIIb is expected to accomplish most of the Project objectives. Therefore, this EIR recommends Alternative IIIb, because it would reduce Project impacts while collecting data to address the key stated Project objectives. Under this alternative, impacts would primarily be reduced through:

- Reducing the survey footprint, which would avoid the MBNMS and the White Rock-Cambria MPAs, and would also reduce impacts to commercial fishing from preclusion and marine wildlife due to noise; and
- Reducing the survey duration, thereby reducing impacts to commercial fishing, air emissions, GHGs, and marine wildlife due to noise.

KNOWN AREAS OF CONTROVERSY/ISSUES TO BE RESOLVED

From written and verbal comments received during the scoping period for the Project’s EIR, comments noted in other agencies’ meetings related to seismic studies at Diablo Canyon, related newspaper articles, and ongoing communication with agencies and other concerned parties, the CSLC has identified the following known areas of controversy/issues to be resolved regarding the proposed Project:

- Technical design of the survey to address potential seismic hazards in the Project area, including:
 - The geographic scope of the study, including how close to shore to run survey track lines;
 - The specific types of studies to conduct (e.g., high-energy deep seismic, high-resolution swath bathymetry, core-sampling, etc.);
 - Whether the current footprint of the study is sufficient to provide meaningful data on the intersection of specific fault zones (e.g., the Hosgri and Los Osos Faults, and the southern terminus of the Shoreline Fault); and
 - The most appropriate technology for analyzing the fault zones.
- Potential to harm marine mammals and other marine biological resources.
- Long-term impacts on fish and commercial fishing.
- Survey activity and air gun noise in marine protected areas.